DAVID L. HENKIN #6876
ISAAC H. MORIWAKE #7141
EARTHJUSTICE
223 South King Street, Suite 400
Honolulu, Hawai'i 96813
Telephone No.: (808) 599-2436
Fax No.: (808) 521-6841
Email: dhenkin@earthjustice.org

Attorneys for Plaintiffs

IN THE UNITED STATES DISTRICT COURT

FOR THE DISTRICT OF HAWAI'I

'ĪLIO'ULAOKALANI COALITION, a Hawai'i nonprofit corporation; NĀ 'IMI PONO, a Hawai'i unincorporated association; and KĪPUKA, a Hawai'i unincorporated association, Plaintiffs, v. DONALD H. RUMSFELD, Secretary of Defense; and FRANCIS J. HARVEY, Secretary of the United States Department of the Army, Defendants.	Civil No. 04-00502 DAE BMK DECLARATION OF JOHN MICHAEL CASTILLO; EXHIBITS "48" – "56"

DECLARATION OF JOHN MICHAEL CASTILLO

I, JOHN MICHAEL CASTILLO, declare under penalty of perjury that:

1. I am a forester, with particular expertise in management of dry lowland and montane Hawaiian ecosystems like those found at the U.S. Army's Pōhakuloa Training Area ("PTA") on the island of Hawai'i and the unique wildfire risk associated with those ecosystems.

2. In 1994, I received a Bachelor of Science Degree in Forestry, with a concentration in forest biology, from Colorado State University. In 1997, I received a Master of Science Degree in Forest Ecosystem Management, also from Colorado State University. My masters thesis was on the control of fountain grass (*Pennisetum setaceum*) in montane dry forest ecosystems in Hawai'i. The landscape affected by the fountain grass invasion and associated high-frequency wildfire regime includes the Army's PTA, which experiences some of the most severe fountain grass-carried wildfires.

3. From 1990 through 1997, I was employed as a research assistant at the Center for Ecological Management of Military Lands, which is now known as the Center for Environmental Management of Military Lands ("CEMML") and is based at Colorado State University. During my tenure with CEMML, I conducted rare plant surveys, vegetation monitoring, and vegetation mapping at PTA from 1990 to 1994. From 1994 to 1997, I led field studies monitoring the effects of

wildfire on rare plants at PTA and conducting field research into methods to control and manage highly invasive fountain grass in dry montane Hawaiian ecosystems.

4. While at CEMML, I co-authored a book on the plant communities found at PTA. I also co-authored a peer-reviewed article on the effects of wildfire on rare plants and vegetation within Kīpuka Kalawamauna at PTA that was published in the proceedings of a 1995 international conference on wildfire effects on rare plants. Details regarding these and other publications, as well as a summary of my professional background, can be found in my resume, a true and correct copy of which is attached hereto as Exhibit 48.

5. After receiving my masters degree, I was hired in 1997 by the U.S. Fish and Wildlife Service ("FWS") as a biologist. I worked in FWS's Honolulu office from 1997 to 2001 and in its Hilo office from 2001 to 2003.

6. As an FWS biologist, I worked on assignments related to the conservation and management of plants, vegetation, and habitat. Assigned geographically to the island of Hawai'i, I worked across six separate division programs implementing programs to promote the conservation and recovery of rare plant and animal species and their habitats. One program on which I spent a significant portion of my time was the Interagency Cooperation Program, under

which I participated in consultations pursuant to section 7 of the Endangered Species Act ("ESA") regarding the impacts of military training at PTA on endangered and threatened species.

7. Since 2003, I have worked as a private Forest Management Consultant with Hawaii Natural Resources Services, LLC ("HNRS"), based in Kamuela, Hawai'i, serving as HNRS's principal consultant and providing consulting and management planning services to government agencies, private landowners, and community-based non-profit organizations. Services I have provided include preparation of forest and watershed management plans, vegetation monitoring, ecological data synthesis, species surveys, hazardous fuels reduction, and wildfire research project management. Among other projects, in 2004, I conducted the periodic, five-year vegetation monitoring of 190 permanent long-term monitoring stations on training lands at PTA for the Army's Division of Integrated Training Area Management. I have also served as the principal investigator and project manager of the Pu'u Anahulu Wildfire Management Study, a federally funded, interagency research project that evaluated wildfire fine fuels reduction techniques for use on the leeward side of Hawai'i Island.

8. In 2006, I instructed courses in forest pest management and agroforestry within Hawai'i Community College's Tropical Forest Ecosystem and Agroforestry Management ("TEAM") Program, in Hilo and Kailua-Kona.

9. Since 2001, I have served as a member of several organizations focused on planning and implementing sound management practices to conserve and restore dryland forest ecosystems in Hawai'i, including the Puu Wa'awa'a Advisory Council, the West Hawaii Wildfire Management Organization, the Hawaii Forest Industry Association, the Dry Forest Working Group, and the Hawai'i Community College Forest TEAM Advisory Board. Through this service I have maintained a management focus toward leeward dry forests of Hawai'i Island and helped implement cooperative fuels management measures to reduce fire threats on state-managed lands adjacent to PTA on the west and southwest.

10. In my work as an employee of CEMML and FWS, and later in my capacity as a private consultant, I have conducted field work at PTA on more occasions than I can remember. I also participated, on November 29, 2006, in a site visit conducted as part of this litigation and had the opportunity to inspect the areas at PTA where the Army proposes to conduct Stryker-related training.

11. I have reviewed the Army's Final Environmental Impact Statement ("EIS") for converting the 2nd Brigade of the 25th Infantry Division into a Stryker

brigade in Hawai'i, the Biological Assessment ("BA") the Army prepared as part of its ESA section 7 consultation regarding routine training and Stryker conversion on Hawai'i Island, the Biological Opinion ("BiOp") the FWS prepared at the conclusion of that consultation, CEMML's Analysis of Fire History and Management Concerns at PTA, the Army's final Integrated Wildland Fire Management Plan and final Integrated Natural Resource Management Plan for PTA, various declarations, discovery responses, and other documents the Army has provided in connection with this litigation, as well as my own records based upon years of studying the ecosystems at PTA and the effects of military training thereon. Based on my background and experience, it is my opinion that allowing the Army to proceed with Stryker-related training at PTA would increase the risk of catastrophic wildfires beyond the levels posed by non-Stryker training, threatening destruction of unique alpine ecosystems and federally listed species. Training with the Mobile Gun System ("MGS") at Range 11T and with 120mm mortars at various firing points, as well as maneuver live-fire training at Ranges 8 and 10 pose particularly increased threats as compared to non-Stryker training conducted at PTA previously. I describe my opinions in greater detail below.

Importance of Ecosystems at PTA

12. The high-elevation dry forest at PTA is one of the rarest on the planet and constitutes one of Hawai'i's ecological jewels. Hawai'i's evolution as a high island archipelago isolated from continents and other major land masses has provided for the development of the most highly endemic ecosystems in the world. Approximately half of the island archipelago is arid due to leeward exposure to the predominant trade winds. Arid environments are among the world's most endangered ecosystems, currently having been reduced by over 85%, particularly in low elevations. Dryland environments on tropical islands have been more heavily impacted by human activity and land uses than wet environments. These uses have been most concentrated in lowland areas below 3,000 feet, and, in Hawai'i, include clearing, intensive agriculture, logging, burning, grazing, and military use.

13. The least disturbed and most intact dryland plant communities remaining in Hawai'i are in montane and subalpine environments limited to the islands of Maui and Hawai'i, of which the central region of Hawai'i Island contains the majority. Upland environments, such as those that occur at PTA, support the largest and most contiguous remaining native-dominated forest and shrubland.

14. PTA is particularly rich in biological treasures. The installation is home to over a dozen federally listed endangered and threatened plants and animals and provides habitat essential for these species' continued survival and eventual recovery. In many cases, all or nearly all known naturally occurring populations of these endangered species are found within the areas FWS's BiOp concluded were threatened by Stryker training at PTA (not including the recently acquired Parker Ranch lands at Kē'amuku), including all naturally occurring individuals of *Solanum incompletum* (popolo ku mai), *Stenogyne angustifolia* (no common name) and *Tetramolopium arenarium* ssp. *arenarium* (no common name), 99% of the *Hedyotis coriacea* (kioele) remaining in the wild, 93% of naturally occurring *Asplenium fragile* var. *insulare* (fragile fern), and over 90% of the wild populations of the white mint *Haplostachys haplostachya* (honohono).

15. The dry montane 'ōhi'a woodlands, ākoko forest, naio-mamane scrub, and diverse ā'ali'i shrublands of the region in which PTA sits are unique and irreplaceable. The lowland dry forest that was once adjacent in the lands downslope in the State-managed Pu'u Anahulu Game Management Area are nearly gone due to the effects of alien-grass carried wildfires that have burned from below on regular intervals since the late 1960s. These fires, and training-ignited fires within and near to the PTA impact area, and the combined impacts resulting from

competition with fountain grass and browsing from feral sheep and goats, are additional factors that make it all the more important to protect the remaining dry forest at PTA.

Increasing Threats to PTA's Unique Ecosystems

16. The existence of native-dominated plant communities and rare species at PTA does not, as the Army has suggested in its court submissions, indicate a tolerance to military training and associated fires. Rather, they are remnant, and highly threatened, vestiges of dwindling habitats, artifacts of recent biological resource inventories that discovered what are likely to be the last remaining populations of once common species now persisting in dwindling habitat patches. Population data for rare plant species at PTA confirm this, showing declines between 1993 and 2003 in the number of populations and total individuals of nearly every threatened and endangered plant species, and many other rare species, that occurs on the installation. These species include *Asplenium fragile* (federally listed as endangered ("E")), *Chamaecyse olowaluana*, *Haplostachys haplostachya* (E), *Hesperocnide sandwicensis*, *Melicope hawaiiensis*, *Silene hawaiiense* (federally listed as threatened), *Silene lanceolata* (E), *Stenogyne angustifolia* (E), *Tetramalopium arenarium* (E), *Zanthoxylum hawaiiense* (E), and others.

17. In my many years of work at PTA, I personally have witnessed this decline, with visible reductions in distribution of native plant communities and increases in alien grassland throughout the impact area and northwestern, northern, and northeastern portions of the installation. Attached hereto as Exhibit 49 is a true and correct copy of a photograph depicting the condition in 1993 of native *Dodonaea* mixed shrubland at PTA that, at that time, supported populations of endangered *Silene lanceolata*, visible in the foreground, which have now been extirpated. Attached hereto as Exhibit 50 is a true and correct copy of a photograph depicting the condition in 2005 former *Dodonaea* mixed shrubland at PTA, showing the invasion of alien grasses.

18. While the ecosystems at PTA currently are still relatively intact, they are experiencing unchecked invasion by fire-promoting fountain grass. Invasive fountain grass is a high loading fine fuel that carries most of the large fires in the region. Attached hereto as Exhibit 51 is a true and correct copy of a photograph I took in 2005 depicting the invasion of fountain grass in a former dry forest located to the west of PTA.

19. The continued spread of fountain grass at PTA has created a more severe wildfire threat in this region than has ever existed previously, and the threat is growing. Fountain grass now forms nearly continuous stands throughout the

western, northern and eastern portions of the installation, with large stands of fountain grass spanning the Impact Area boundary in Ranges 10, 11T, 13, and 17. The fountain grass distribution is spreading across the young lavas to connect many of the pockets of older, wooded kīpuka that have historically supported fountain grass and fire. This pattern of fountain grass spread throughout northern portions of the impact area is connecting target areas near Twin Pu'us and Range 17 in the northwest portion of the installation with large pockets of fountain grass in Ranges 13, 12, 11T, and 10. In the past, small pockets of fountain grass were allowed to burn without incident. However fuelbed conditions between these pockets are becoming more continuous and heavily loaded with grass fuels that carry larger fires into native forest areas.

Proposed Stryker Training Threatens Catastrophic Harm

20. The Stryker-related training the Army now proposes to conduct at Ranges 8, 10, and 11T, as well as at various 120mm mortar firing points, would increase the risk of catastrophic wildfires beyond the levels poses by non-Stryker training, threatening destruction of unique alpine ecosystems and federally listed species. There are several factors that lead to this conclusion. First, as documented in the Army's BA, proposed Stryker training will increase the number of potentially fire-producing rounds fired at PTA, including ammunition like

tracers and illumination and white phosphorus mortars that have a "high" fire ignition potential. At Ranges 1 and 10, proposed Stryker training would increase the number of tracer rounds fired by over 4,700. Use of mortars from various firing points would increase by nearly 4,800, including an increase of nearly 1,200 in the number of rounds of illumination and white phosphorus rounds. The Army also proposes to introduce training with an entirely new weapon system – the MGS – at Range 11T, which would fire thousands of 105mm rounds. Attached hereto as Exhibit 52 are excerpts from a true and correct copy of the Army's Biological Assessment for Stryker training at PTA.

21. In 2002, CEMML produced an Analysis of Fire History and Management Concerns at PTA, which concluded that "areas receiving the highest use suffer the most frequent fires," an assessment with which I concur. Historic wildfire records show many fires associated with training at Ranges 1, 8, 10, and 11T, due to their heavy utilization. By increasing the number of rounds fired at these ranges (and, thus, the abundance of ignition sources), Stryker training would increase the incidence of fires, any one of which could destroy endangered species and unique native ecosystems. Attached hereto as Exhibit 53 are excerpts from a true and correct copy of CEMML's analysis.

22. In discussing the potential for proposed Stryker training to harm native ecosystems and listed species at PTA, the Army has improperly focused narrowly on the biological resources present on the ranges where the training would take place. While those resources undoubtedly are valuable and deserving of protection (during the November 29, 2006 site visit, I personally observed threatened *Silene hawaiiense* at Range 8 and native trees and shrubs at all other ranges proposed for training), the more significant threat of harm to irreplaceable biological resources comes from the potential for Stryker training to spark fires that ignite the sea of fountain grass at PTA and spread far beyond the specific ranges where training would occur to destroy current intact native ecosystems located elsewhere at the facility, and beyond PTA's boundaries. The proposal to introduce the MGS at Range 11T, as well as the increased use of mortars throughout PTA, would increase the potential for ammunition to land outside of targeted areas, increasing the size of areas where impacts – including catastrophic wildfires – are likely to occur. One need only compare the map of areas of high fire vulnerability at PTA (Figure 17 to the Army's BA) with the enormous surface danger zone ("SDZ") – the area where ammunition may land – for proposed training at Range 11T to realize the significant threat of catastrophic wildfires posed by Stryker training. Attached hereto as Exhibit 54 is a true and correct copy

of a map provided by the Army showing the composite SDZ for proposed training at Range 11T.

23. Attached hereto as Exhibit 55 is a true and correct copy of a photograph showing the view, as it appeared on November 29, 2006, looking from Range 11T toward the PTA impact area, with Range 10 in the background at left. The photograph illustrates the fine fuel loading resulting from the invasion of fountain grass that now threatens to carry fires from Stryker training over larger distances and between ranges.

24. As at Range 11T, proposed training at Range 8 would increase risks of fire as compared with the type of training that currently occurs there. Currently, training at Range 8 consists of soldiers firing at targets from static firing points immediately adjacent to the Redleg Trail, the main road along the eastern side of PTA. The Army proposes to turn Range 8 into a maneuver training area, with Strykers traveling downrange and laterally along the target maintenance roads, firing at targets as they go. Even if the Strykers did not crush any of the threatened *Silene hawaiiense* that are found along the maintenance roads, the proposed training would increase the size of the area affected by the range's use, including nearby areas to the sides of the range that previously were not in the line of fire. By increasing the area potentially affected by ammunition fired at Range 8, the

proposed Stryker training would create a larger ignition zone surrounding the range. Coupled with the continued fountain grass spread throughout this region, the potential for training-related fires at Range 8 would increase markedly.

25. Even in instances when proposed Stryker training did not itself ignite fires at PTA, it would nonetheless exacerbate the fire-grass invasion cycle. It would do so in two ways. First, by increasing the use of mortars, 105mm rounds and other ammunition, proposed Stryker training would increase fine fuel loads through disturbance (i.e., breaking down currently barren lava fields) which creates favorable habitat for fountain grass to spread. In addition, the movement of Stryker vehicles around PTA would promote weed spread, increasing the number of potential ignition sources.

26. Even if properly funded and implemented, the Army's Integrated Wildland Fire Management Plan ("IWFMP") would not prevent catastrophic fires associated with proposed Stryker training as both existing and proposed measures to manage and reduce wildfire risk are too narrow in scope and inadequate in scale. First, the minimum fire fighting personnel and equipment resources identified in the IWFMP are inadequate to prevent catastrophic wildfires. Of the ten trained wildfire staff, only six are required to be on duty during any Stryker training exercise. Two of these six personnel can be range control personnel, leaving only

four required by the fire department. If one of these persons is required to serve as Fire Dispatch and two are needed in each Hum-V brush engine, that leaves only one properly staffed Brush engine resource available to respond to any incident. Range control staff often have other duties that take precedence over firefighting, including range dispatch, range safety, and coordination of operations, maintenance, and range operations. Handling multiple fires at one time or large wildfire incidents are obviously far beyond the capability of these limited resources.

27. The limitations of the meager fire-fighting resources on-site are compounded by the inadequacy of the wildfire fuels reduction measures, which can neither control nor contain the spread of fountain grass or allow for effective management of large fires. The existing compartments delineated by fuels management corridors are simply too large to be effective in managing fires. A single fire that ignites a large stand of fountain grass can easily spread over thousands of acres within the installation, destroying native forest areas.

28. The foregoing analysis assumes that the IWFMP is fully funded and implemented as intended. History has shown, however, that the Army's fire management plans, even when they look good on paper, generally are not properly implemented, resulting in catastrophic fires from training-related activities. For

example, in July 2003, the Army conducted a prescribed burn at Mākua Military Reservation ("MMR") on O'ahu to clear vegetation. Even though the fire was intentionally set, and thus the Army presumably had the opportunity to ensure conditions were perfect to ensure complete containment, the fire escaped and burned approximately 2,100 acres. The fire jumped the Army's firebreaks in every direction, burning up to the ridgelines where the most sensitive habitat for endangered species is located, and extending beyond MMR's boundary. According to the Army's own assessment, the fire burned at least 71 individual endangered plants, as well as about 150 acres of designated critical habitat for the endangered O'ahu 'elepaio (a bird) and about six acres of critical habitat that had been designated the previous month for six endangered plant species.

29. The Army's investigation of the July 2003 Mākua fire confirmed serious problems with the Army's ability to suppress fires. The Army identified "[a] combination of human error; inadequate communication capabilities at MMR; problems with command and control/synchronization of fire fighting assets; [and] failure to fully utilize aviation assets to suppress the fire" as key causes of the Army's inability to maintain control over a fire it had intentionally set, under conditions it had determined were favorable for the exercise. Excerpts from a true

and correct copy of the Army's August 2003 Post-Fire Assessment are attached hereto as Exhibit 56.

30. Because of the vulnerability of the ecosystems at PTA to fire, as well as the inevitability of human error that prevents plans from being executed as written, FWS concluded in its BO that, even with the IWFMP, "full control of fires [at PTA] is not possible, even with precautions and restrictions in place," and "the fire risk, as stated in the Transformation Biological Assessment, is underestimated and the Service believes the risks to all species and habitats is higher than the Army has indicated." I agree completely with this analysis.

31. Specifically with respect to the proposed training with the MGS, the mere fact that, decades ago, tanks firing 105mm rounds used Range 11T does not, as the Army alleges, disprove claims the MGS's use of Range 11T would threaten substantial harm to biological resources at PTA. First, the lack of available wildfire data from the time tanks trained at Range 11T means there is no way to assess the frequency or intensity of fires associated with such training at PTA. Likewise, the lack of available data regarding the number and distribution of rare, threatened and endangered species at PTA prior to training with tanks at Range 11T means there is no way to assess the impact on biological resources of such training. Accordingly, the mere fact that, in the past, training with tanks occurred

provides no useful information for assessing the likely impacts of the proposed MGS training.

32. In addition, although the range of invasive fountain grass during the time tanks were being used at PTA is unrecorded, the rapid spread of fountain grass over the past fifteen years indicates that its abundance and total fuel load at Range 11T – and elsewhere on the installation within the surface danger zone of rounds fired from Range 11T – was likely substantially less. Thus, the risk of catastrophic fires at the time tanks used Range 11T was substantially less than it is at present.

I declare under penalty of perjury that the forgoing is true and correct to the best of my knowledge, information, and belief.

Dated at Hāwī, Hawai'i, December 13, 2006.

JOHN MICHAEL CASTILLO